NC STATE UNIVERSITY

Comparative Medicine Institute

Ron Baynes, DVM , PhD

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Education:
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Pharmacokinetics of Transdermal Delivery and Drug Residues

Research emphasis:

Dr. Baynes' research focus area is pharmacokinetics and the use of comparative animal models and computational models to better understand drug/chemical uptake and disposition in the body. Specific focus areas include transdermal delivery and formulation effects and hazardous chemical update and disposition in skin. His laboratory is also using pharmacometric methods to quantify drug disposition in food animal species in various age groups and diseased populations to better understand drug efficacy and drug residues in milk, meat, and related food items. The above activities are supported by an analytical chemistry laboratory (UPLC/MS/MS; GC/MS/MS) supervised by trained analytical chemists.

Application:

- Transdermal Drug Delivery
- Dermal Toxicology Assessment
- Dermal Occupational Exposure
- Drug Residues in Food Animals

Collaboration potential:

- In Vitro and In Vivo Skin Absorption Testing
- In Vivo Skin Toxicity Testing
- Pharmacokinetics
- Analytical Chemistry

Selected publications:

Shelver, W, Smith, D; Tell, L, **Baynes,** R, Schroeder, JW, Riviere, J. (2016). Screening and confirmatory analyses of flunixin in tissues and bodily fluids after intravenous or intramuscular administration to cull dairy cows with or without lipopolysaccharide challenge. *J. Agric. Food Chem* (in press).

Howard, J.T., O'Nan, A.T., Maltecca, C**., Baynes, R.E.**, Ashwell, M.S. (2015). Differential gene expression across breed and sex in commercial pigs administered fenbendazole and flunixin meglumine. PLoS ONE 10(9): e0137830.doi:10.1371/journal. pone.0137830

Roux LN, Brooks JD, Yeatts JL, **Baynes RE**. (2014). Skin absorption of six performance amines used in metalworking fluids. J Appl Toxicol.2014, Sep 4. doi: 10.1002/ jat.3056. [Epub ahead of print]

Xu G, Hughes-Oliver JM, Brooks JD, **Baynes RE**. (2013). Predicting Skin Permeability from Complex Chemical Mixtures: Incorporation of an Expanded QSAR Model. SAR QSAR Environ Res. 24(9):711-731.

Baynes, RE., Riviere, JE., Franz, T., Monteiro-Riviere, NA., Lehman, P., Peyrou, M., Zollers, B. (2012). Bioequivalence of Topical Dosage Form. *J. Vet Pharmacol. Thera*p. 35 Suppl 1: 103-114